NOAA Research in Alaska

AK-1 (Aleutians)

Pacific Marine Environmental Laboratory
Steller Sea Lion Research

The Pacific Marine Environmental Laboratory (PMEL) is leveraging its accomplishments in its Fisheries-Oceanography Coordinated Investigations program and its understanding of North Pacific climate variability into a lead role in the investigation of the decline of Steller Sea Lion populations in the Aleutians. PMEL works closely with NMFS and several Alaska state agencies and private organizations in this effort. PMEL received $3.4 million in funding for this work in 2001. For more information please visit http://www.pmel.noaa.gov/steller/

AK-1 (Barrow)

Climate Monitoring and Diagnostics Laboratory
Barrow Baseline Observatory

NOAA's Climate Observations and Services Program supports a network of four fully-equipped Baseline Observatories operated by the Climate Monitoring and Diagnostics Laboratory (CMDL) in Boulder, Colorado. The observatories are in Barrow, Alaska; Mauna Loa, Hawaii; on the Island of Tutuila, American Samoa; and at the South Pole, Antarctica. Since 1973, CMDL has operated the Barrow Observatory as part of a global network of observatories to track and document concentrations of atmospheric elements such as carbon dioxide, methane, and carbon monoxide which can affect the world's climate, and man-made fluorocarbons that destroy the stratospheric ozone layer. Ozone both at the surface and in the total column above Barrow is measured at the observatory. The observatory also monitors air pollution (Arctic haze) flowing across the Arctic from Eurasia to Alaska which has been decreasing since the collapse of the Soviet Union. Due to its unique location, dedicated and highly trained permanent staff of two scientists/engineers, and excellent power and communications infrastructure, the Barrow Observatory is host to 25 cooperative research projects from various universities and government agencies from around the nation. Funding for the four observatories reached $1.611 million in FY 2001. This funding supports operational costs, repairs and upgrades of facilities and equipment, operational cost shortfalls associated with the aerosol monitoring measurements, and carbon measurements at the observatories as well as the associated maintenance of the calibration scale and flask sampling network. Funding for the Point Barrow Observatory in FY 2001 was $550,000. For more information please visit http://www.cmdl.noaa.gov/obop/index.html

AK-1 (Barrow, Nome, and St. Paul Island)

Climate Monitoring and Diagnostic Laboratory
Ultraviolet Radiation (UV) Monitoring Network

The Climate Monitoring and Diagnostics Laboratory (CMDL) operates an ultraviolet radiation (UV) monitoring network in Alaska with sites at the Barrow Observatory, Nome, and St. Paul Island. These measurements are done in as part of the CMDL Solar and Thermal Atmospheric Radiation group's research on the Earth's surface radiation budget. The group specializes in the investigation of climatically significant variations in long-term radiation and meteorological measurements made primarily at a globally diverse network of surface sites. Research efforts are devoted to the extent and cause of observed variations and in collaborating with other research groups making satellite observations and climate model calculations. In addition, observations of spectral solar radiation are made for the purpose of remote sensing of certain atmospheric constituents. A relatively new program in the group is the absolute measurement of spectral solar UV for the investigation of the interaction of ozone and solar radiation. For more information please visit http://www.cmdl.noaa.gov/star/index.html

AK-1 (Barrow)

Air Resources Laboratory
Mercury Monitoring

NOAA's Air Resources Laboratory (ARL) began a program to monitor the airborne concentrations of gaseous mercury at the NOAA Baseline Observatory in Barrow in September, 1998. Mercury is an important pollutant in the Arctic with a tendency to bioaccumulate in the marine food chain. It is largely a product of fossil fuel combustion and waste incineration and can travel for long distances through the atmosphere. The measurements made are being used in conjunction with backward trajectories, computed using the ARL HYSPLIT4 trajectory model to determine possible source regions of mercury affecting the Barrow area. The mercury study is funded by the NOAA Arctic Research Initiative and administered by the Cooperative Institute for Arctic Research (CIFAR). For more information please visit http://www.arl.noaa.gov

AK-1 (Barrow)

Environmental Technology Laboratory
Climate Research

NOAA's Environmental Technology Laboratory is participating in several long-term climate research programs near Barrow. Radiometers and cloud radars routinely measure important properties of clouds that affect climate such as height, thickness, particle type (ice or water), water content, and ice content. These measurements also help improve and validate similar measurements made from space by environmental satellites. Ultimately the knowledge of how arctic clouds affect the global climate system will be improved so that better predictions can be made of how man and nature might change climate. For more information please visit http://www.etl.noaa.gov

AK-1 (Bering Sea)

Ocean Exploration
Next Generation Tools for Benthic Habitats

In 2001, with a $4 million appropriation from Congress, NOAA launched a systematic, strategic effort through the Office of Ocean Exploration to search and investigate the oceans for the purpose of discovery. Exploration included a study of the impact of trawling on soft bottom benthos in the eastern Bering Sea as part of the Next Generation Tools for Benthic Habitats voyage of discovery. The research used state-of-the-art Klein 5000 side-scan sampling to explore relationships between small-scale geological features. The voyage was led by the Alaska Fisheries Science Center. For more information please visit http://www.oceanexplorer.noaa.gov/

AK-1 (Bering Sea and Gulf of Alaska)

Pacific Marine Environmental Laboratory
Fisheries-Oceanography Coordinated Investigations

The Pacific Marine Environmental Laboratory (PMEL) and the National Marine Fisheries Service (NMFS) are conducting the Fisheries-Oceanography Coordinated Investigations (FOCI) in the Bering Sea and Gulf of Alaska. The goal of FOCI is to understand the influence of the ecosystem and climate variability on the abundance of commercially valuable fish and shellfish stocks in Alaskan waters. The Cooperative Institute for Arctic Research (CIFAR) , the University of Alaska Fairbanks, and other institutions are participants in FOCI studies. Early FOCI research was directed at walleye pollock, leading to improved forecasts of pollock recruitment. In recent years FOCI has taken a broader view of studying the greater ecosystem in the Bering Sea and Gulf of Alaska. FOCI is funded primarily by NOAA Research, NMFS, the National Ocean Service, the International Arctic Research Program, and the North Pacific Marine Research Program. For more information please visit http://www.pmel.noaa.gov/foci/

AK-1 (Central, Glennallen, and Talkeetna)

Forecast Systems Laboratory
GPS Meteorological Observing Systems

NOAA's Forecast Systems Laboratory (FSL) operates a rapidly expanding network of GPS Meteorological (GPS-Met) Observing Systems to monitor the total quantity of precipitable water vapor in the atmosphere. Currently, there are 93 systems over the contiguous 48 states and Alaska, and plans are being made to extend these observations to Hawaii, Puerto Rico, the Caribbean Islands, and Central America. Water vapor is an important but under-observed component of the atmosphere that plays a major role in severe weather events and the global climate system. GPS-Met systems provide accurate water vapor measurements under all weather conditions, including thick cloud cover and precipitation, and do so at very low cost. The major reason why this system is so economical is that the network is being developed by FSL in cooperation with federal, state and local government agencies, universities, and the private sector. The GPS stations provide high-accuracy surveying and navigation services for National defense, automated agriculture, safe land and marine transportation, government infrastructure management, and 911 emergency response services.

Fortuitously, these systems can also be used for meteorology with the addition of surface weather sensors. GPS-Met systems located in Alaska include sites operated by NOAA near Central, Glennallen, and Talkeetna. The University of Alaska operates another site near College, with another planned near Pt. Barrow. Five sites to be operated by the U.S. Coast Guard are also planned in the near future. For more information please visit http://www.gpsmet.noaa.gov/jsp/index.jsp

AK-1 (coastal communities)

Pacific Marine Environmental Laboratory
Tsunami Research Program

The Tsunami Research Program at the Pacific Marine Environmental Laboratory (PMEL) seeks to mitigate tsunami hazards to Alaska, Washington, Hawaii, California, and Oregon. A tsunami is a series of very large ocean waves caused by underwater earthquakes, landslides, volcanic eruptions, explosions, and even meteor impacts. Capable of flooding hundreds of meters inland past the typical high-water level, the fast-moving water associated with an inundating tsunami can crush homes and other coastal structures. Research and development activities focus on improved tsunami inundation maps for coastal communities and advanced technology to increase the speed and accuracy of tsunami forecasts and warnings. PMEL has developed and deployed an array of early warning buoys in the Pacific to increase the reliability of tsunami warnings. This array consists of six moored buoys located at key deep water sites to improve risk assessment from tsunamis associated with major earthquake hazard areas around the Pacific Basin. One of the primary aspects of this work is the National Tsunami Hazard Mitigation Program, a state/federal partnership created to reduce the risks of tsunamis to U.S. coastal areas. This program was funded at $2.3 million in FY 2001. For more information please visit http://www.pmel.noaa.gov/tsunami/

AK-1 (coastal waters)

Environmental Technology Laboratory
Fish Lidar

NOAA's Environmental Technology Laboratory is doing numerous surveys in the Alaskan coastal waters using the NOAA Fish Lidar. One study compared lidar to acoustics in the Gulf of Alaska and was conducted jointly with the University of Alaska Fairbanks. Another study surveyed pre-spawning herring in Prince William Sound as part of a program with the Prince William Sound Science Center. Studies of predator/prey relationships involving Steller Sea Lions are being conducted in the vicinity of Kodiak Island and new Juneau in collaboration with the Prince William Sound Science Center, the University of Alaska Fairbanks, and the Alaska Department of Fish and Game. Finally, a test of the use of the NOAA Fish Lidar to help find and identify abandoned fishing gear (ghost nets) is being led by an Alaskan company. Additional surveys are being discussed. For more information please visit http://www1.etl.noaa.gov/lidar/

AK-1 (Fairbanks)

Cooperative Institute for Arctic Research

The Cooperative Institute for Arctic Research (CIFAR) at the University of Alaska Fairbanks is designed to serve as a focal point for interactions between NOAA and the arctic research community through the University of Alaska. CIFAR focuses on research activities related to NOAA's tasks and responsibilities in the Western Arctic. CIFAR conducts research on a wide variety of issues critical to the Arctic, focusing on atmospheric and climate research, climate modeling, UV and arctic haze studies, marine ecosystem research, fisheries oceanography, hydrographic and sea ice studies, tsunami research, and contaminants effects. In FY 2001 CIFAR supported 30 Alaska-based scientists, post-docs, graduate students, and staff and was funded at $2.5M. CIFAR also supported a number of other university and government researchers conducting research on the above themes at institutions outside of Alaska. For more information please visit http://www.cifar.uaf.edu

AK-1 (Based in Fairbanks - serves entire state)

National Sea Grant College Program
Alaska Sea Grant College Program

The Alaska Sea Grant College Program, part of the National Sea Grant College Program, is a statewide network of research, education, and extension services that works to promote the wise use of marine resources. Current research and outreach education projects address fisheries management, seafood science, marine environmental policy and marine ecosystems. Alaska Sea Grant also supports formal graduate education throughout the University of Alaska system. Its Marine Advisory Program personnel support a range of public education programs addressing marine safety, seafood technology, marine business practices, marine recreation, aquaculture and marine mammals. Sea Grant works in partnership with the Alaska Department of Fish and Game, the North Pacific Fishery Management Council, and with federal and co-management agencies to address resource management issues. In FY 2001, Alaska Sea Grant projects received funding of approximately $1.6 million from the National Sea Grant College Program and $0.6 million in federal pass through funding. For more information please visit http://www.uaf.edu/seagrant/

AK-1 (Fairbanks)

National Undersea Research Program
National Undersea Research Center for the U.S. West Coast and Polar Regions

The National Undersea Research Center for the U.S. West Coast and Polar Regions is located at the University of Alaska Fairbanks School of Fisheries and Ocean Sciences. It is one of six regional centers supported by the National Undersea Research Program. The region served by the Center includes the vast area along the western margin of North America from the Arctic Ocean off of northern Alaska to the marine waters off Southern California as well as waters off of Antarctica. The Center leases and makes available to marine scientists an array of advanced undersea technology systems, including low-cost and advanced remotely operated vehicles, geophysical instruments such as side-scan sonars and high-resolution seismic reflection systems, and shallow and deep-diving submersibles. Many fisheries-related studies have been supported by the Center, as well as studies on

a broad range of topics including active faulting, methane vents, sediment geochemistry, material flux, lake ecology, ice dynamics, and benthic biology. FY 2001 funding for the Center totaled $2.69 million. For more information please visit http://www.wcnurc.alaska.edu:8000

AK-1 (North Slope)

Air Resources Laboratory
Atmospheric Research

The Air Resources Laboratory's Atmospheric Turbulence and Diffusion Division (ATDD) has been collaborating with faculty and staff of San Diego State University to measure the air-surface exchange of carbon dioxide (CO_2) over the tundra on the North Slope of Alaska. ATDD has applied specialized fast-response instruments on towers to study the variability of the exchange rate with time at a few locations, and on a specially instrumented research airplane to study the spatial variability of the exchange as it changes with the underlying surface type. Several multi-week studies have been completed, mainly during the Arctic summers. A continuously operating tower system has been operating successfully during most of the year near the CMDL Baseline Observatory at Barrow, despite the harsh winter conditions. For more information please visit http://www.arl.noaa.gov

AK-1 (statewide)

Arctic Research Initiative

NOAA's Arctic Research Initiative supports research, monitoring, and assessment projects to study natural variability and anthropogenic influences on Western Arctic/Bering Sea ecosystems. These activities are implemented through a partnership between NOAA and the Cooperative Institute for Arctic Research at the University of Alaska. Activities undertaken are a U.S. contribution to the international Arctic Council's Arctic Monitoring and Assessment Program. Projects supported by this program are expected to lead to better understanding of Arctic contaminants and their pathways, the effects of climate change including increased ultraviolet radiation, and the combined effects of stresses from climate change and various contaminants. In FY 2001 this initiative was funded at $1.65 million. For more information please visit http://aro.oar.noaa.gov

AK-1 (statewide)

Climate Diagnostics Center
Climate Research

NOAA's Climate Diagnostics Center (CDC) is conducting research sponsored by the International Arctic Research Center on the response of atmospheric general circulation models to different sea ice configurations. If the observed melting of the Arctic pack ice continues, understanding the response of the atmosphere to changing sea ice conditions will be important in the prediction of impacts throughout the Northern Hemisphere, especially on the regional climate of Alaska. CDC is also investigating the possible role of climate variations in the North Pacific Ocean as it affects the population of Steller Sea Lions in the vicinity of Alaska. For more information please visit http://www.cdc.noaa.gov